

**ABSTRACT**

A process for the generation of electricity and the production of a concentrated carbon dioxide stream using a molten carbonate fuel cell. Anode off-gas is at least partly fed to a catalytic afterburner wherein it is oxidized with an oxidant consisting of part of the cathode off-gas and/or part of a molecular oxygen containing external oxidant stream, which external oxidant stream has at most 20% (v/v) nitrogen. The oxidized anode off-gas is brought into heat exchange contact with the remainder of the cathode off-gas and the remainder of the external oxidant stream to obtain cooled anode off-gas and a heated mixture of cathode off-gas and external oxidant which are fed to the cathode chamber as the cathode inlet gas. As soon as a set point in the carbon dioxide concentration at the cathode chamber outlet is reached, part of the cooled anode off-gas is withdrawn from the process.